

Maricopa County Environmental Services Department

Quality and Compliance Division

Stormwater Quality Program



**Environmental Services
Department**

Stormwater Pollution Awareness Survey Report

FY2013

Paul Catanzariti
Environmental Health Specialist, Outreach

Executive Summary

In December 1999, the U.S. Environmental Protection Agency (EPA) finalized a rule that requires certain small municipal separate storm sewer systems (MS4s) to participate in the National Pollutant Discharge Elimination System program and obtain a stormwater permit. The intent of this rule is to reduce pollutants in stormwater runoff through actions implemented by the operators of MS4s, such as the system operated by Maricopa County. The Arizona Department of Environmental Quality (ADEQ) is the permitting authority for the State of Arizona through the Arizona Pollutant Discharge Elimination System (AZPDES). Under a general permit, the County must implement a Stormwater Management Program (SWMP) with Minimum Control Measures (MCMs) that demonstrate compliance with permit requirements. One of the MCMs is Public Involvement/Participation.

In order to meet its AZPDES permit requirements and engage the public in the Stormwater Program, the County has developed a Stormwater Pollution Awareness Survey. The purpose of the survey was to monitor County residents' awareness of stormwater pollution. More specifically, the study focused on the following areas:

- Effectiveness of the County's public outreach campaign
- Attitudes about threats posed by stormwater pollution
- Knowledge of contributors to stormwater pollution
- Personal practices of waste disposal

The results of the survey, presented below, will be used to direct the public outreach and education efforts of the Stormwater Program. This direction will allow the education campaign to place greater emphasis on and increase awareness of those pollutants which the public perceives as posing little threat to the water quality of Maricopa County.

Introduction

The Maricopa County Environmental Services Department Stormwater Quality Program conducted a stormwater pollution awareness survey during fiscal year 2013. This survey was a follow-up to surveys conducted during fiscal years 2011 and 2012. The results of the survey are based upon 422 responses and will be used to structure future outreach efforts and educational campaigns (For comparison, 155 and 69 responses were received from the 2011 and 2012 surveys, respectively).

Methods of Delivery

In an effort to obtain a greater number of responses, multiple methods were used to deliver the 2013 survey: web-based and in-person paper-based surveys (the 2012 survey was only conducted on-line). A link to the survey was available on the Department's and the Program's web pages; information and invitations to participate in the survey were sent out via the Department's Twitter and Facebook accounts and a press release on the County's home page; paper surveys, which also contained a QR (quick response) Code, allowing use of mobile devices to respond to the survey, were distributed at public outreach events, either handed directly to attendees or contained within reusable shopping bags available for the taking. Travel coffee mugs were offered as incentives for taking the survey at outreach

events. Postcard mailers directed to residents of the unincorporated areas of the County were not utilized to advertise the survey due to limited effectiveness observed in the prior year.

The Survey

The survey consisted of four questions regarding stormwater pollution: participants were asked if they were familiar with any stormwater pollution messages; a list of potential pollutants was provided and participants were asked to rate the level of threat to our waterways posed by each potential pollutant; a list of pollution prevention practices was provided and participants were asked in which, if any, of these practices they engaged. One new question was added for the 2013 survey: respondents were asked if they owned a dog and if so, did they pick up after their pet. This question was added as a result of the 2012 survey, in which 84% of the respondents felt that pollution from pet waste posed at least somewhat of a threat, while only 65% picked up after their pets.

For demographic purposes, participants were asked in which jurisdiction they lived. Respondents were also encouraged to provide comments or suggestions to the Stormwater Program. A copy of the survey may be found in Appendix A.

Summary of Findings

A summary of the survey results is provided below. Detailed results can be found in Appendix B.

- Approximately 50% of respondents recalled reading, hearing, or seeing messages about stormwater pollution
- 85% of respondents felt that automobile oil/fluids are a serious or very serious threat; 83% had their oil changed by a professional or recycled their used oil
- As with the 2012 survey, the highest percentage of respondents (89%) felt that chemical wastes from industry are a serious or very serious threat
- 24% of respondents felt that yard waste posed minimal or no threat, while 46% disposed of yard waste properly
- 19% of respondents felt that pet waste posed minimal or no threat and 84% picked up after their pets
- 81% of respondents felt that chemical wastes from households are a serious or very serious threat, yet only 59% indicated that they disposed of household chemicals properly
- 77% felt that herbicides/pesticides/fertilizers are serious or very serious threats; 70% indicated that they limit the use of these products
- 9% of the respondents reside in unincorporated Maricopa County

Comparison to Previous Survey Results

A summary of the results of the 2013 survey as compared to the 2011 and 2012 surveys is provided below. Detailed comparisons can be found in Appendix C.

- The largest percentage change in pollutant threat perception from the 2012 survey was a 10% decrease (84% to 74%) in the number of respondents that viewed fertilizers as a serious or

very serious threat to our waterways. There was a corresponding 8% increase of those that viewed fertilizers as posing little or no threat. Not surprisingly, there was a decrease of 9 % in those that said they limited their use of fertilizers. This same category showed a 13% increase in those that perceived fertilizers as a serious or very serious threat from 2011 to 2012.

- With the exception of fertilizers, beginning in 2011, no other potential pollutant had a year-over-year change in perception (increase or decrease) of more than 8%
- The percentage of respondents that said they picked up after their pets increased dramatically from 65% in 2012 to 84% in 2013.
- There was a 4% increase in those that viewed yard waste as a serious or very serious threat, yet the percentage of participants that properly disposed of yard waste decreased by 30%.
- There was an 21% decrease (30% to 9%) in respondents that reside in unincorporated areas of Maricopa County

Conclusions

The number of respondents in 2013 increased by over 60% from 2012 (422 vs 155). This number represents an 84% increase from 2011. A variety of options for responding to the survey (on-line, via mobile device by use of a QR code, in-person paper) were offered in 2013, whereas the 2012 survey was only available on the Stormwater Program's web site. The increase in participation was a direct result of the additional delivery methods, particularly the distribution of surveys at outreach events (83% of the survey responses were obtained by this method). Despite the increase, the number of participants still represents a very small sample of the population.

There was a significant decrease in the number of respondents representing the target audience of the Stormwater Program (residents of the unincorporated areas of the County). In 2012, mailers were sent to 10,000 random residents of unincorporated Maricopa County, inviting recipients to participate in the on-line survey. This led to a 24% increase over the previous year in the number of respondents from those areas, but in terms of actual numbers of respondents, was still insignificant. Because of the cost and minimal effect of the mailers, they were not utilized in 2013, likely resulting in the decrease in participation from this segment of the population. Although the total UUA population does not appear to be reached, the population in general in the valley has had a significant increase.

All of the pollutants listed on the survey pose some level of threat to our surface waters, and based on the results of the 2013 survey, the majority of the respondents recognized this fact. However, with the exception of sewage, there were increases in the percentage of respondents that saw little or no environmental threat in each of the pollutant categories. While many of the participants continue to practice some form of pollution prevention, the percentages of those that do decreased in a majority of the listed categories.

As with previous years, the urban/rural variation across Maricopa County was apparent in the survey results. In the 2013 survey, the percentage of respondents residing in the more rural areas of the Valley decreased by over 30%. This may be one explanation for the dramatic increase in the percentage of respondents that stated they picked up after their pets (urban residents appear more likely to practice this behavior). Another possible explanation: 83% of the survey responses were via paper survey,

completed in the presence of the surveyor, as opposed to 100% on-line responses during the previous year. Some of the respondents may have been embarrassed to admit that they did not pick up after their pets. Another example of the urban/rural variation can be seen in the 8% increase of those that viewed fertilizers as little or no threat to the environment. Fertilizer use may be less common in urban areas and thus perceived as less of a threat.

Despite increased attendance at public events, an increase in the number of people contacted, the use of the internet and Twitter to relay information, billboard advertising, and public service announcements played on valley radio stations and at movie theaters, the percentage of respondents that recalled reading, seeing, or hearing a message about stormwater pollution remained the same (50%) from the previous year.

Because of the small sample size and the mix of urban and rural geographies within the County, the results of the survey may not be a good representation of the knowledge of and attitudes toward stormwater pollution of the residents of Maricopa County as a whole. If possible, the data obtained in this survey should be compared to data collected by other municipalities in the County to obtain a more complete picture.

Pros and Cons

The Stormwater Pollution Awareness survey can be a powerful and effective tool in crafting the County's stormwater public outreach campaign; however, the survey does have its disadvantages as well.

Pros

- Multiple methods of delivery appears to have led to increased responses
- Respondents represented a variety of municipalities throughout the Valley
- The survey provided another avenue to spread awareness about stormwater pollution
- Analysis substantiated general attitudes, awareness, and behaviors regarding stormwater pollution
- Results provide a focus for future outreach efforts

Cons

- Sample size of the survey was limited and may not represent the population as a whole
- May show response bias - Respondents may falsify a response due to embarrassment (e.g. claiming to pick up and dispose of dog waste - because they know that is the proper behavior, but it may not necessarily reflect their actual behavior; this bias may be more common with the in-person surveys)
- May show response set bias - Respondents answer the entire set of questions with the same response; this bias was observed on many of the survey responses
- There are inherent difficulties and significant challenges in reaching the target populations in our UUA islands.

Future Direction

Based on the results of the 2013 survey, pet waste continues to be the perceived as posing little or no threat to the environment by the highest percentage of respondents. In an attempt to change this perception among County residents, in the past year, pet waste was addressed by providing 10,000 pollutant-specific fact sheets to Maricopa County Animal Care and Control to be distributed with pet adoptions, distributing pet waste containers, distributing pet waste fact sheets to home owners' associations, developing and delivering presentations dealing specifically with pet waste to dog clubs, and attending dog-specific public events (e.g. dog hikes at County Parks, Woofstock). The outreach campaign also placed greater emphasis on the health risks associated with pet waste by developing and distributing a retention basin safety fact sheet.

Despite these efforts and the efforts of others (cities have rules or regulations regarding pet waste disposal and have focused outreach in this area; an increasing number of home owners' associations and parks are providing pet waste bags), our findings indicate that there is still a need for public education; therefore, to address this need, educational campaigns should continue to emphasize the threats that pet waste poses to human health through vector-borne diseases and to the environment.

In the 2012 survey, several of the respondents commented on the difficulty of disposing household hazardous waste and yard waste (limited collection times/facilities, lack of advertisement). To address these concerns, a fact sheet discussing proper waste handling and disposal methods was developed. The comments were also shared with Maricopa County Waste Resources and Recycling Management Department (WRRM). These efforts to increase public awareness were unsuccessful as similar comments were received in the 2013 survey. These comments were reflected in the results of the survey (59% of the respondents said they properly disposed of household chemicals; 46% said they properly disposed of yard waste-both decreases from the previous survey). In 2014, efforts to increase awareness on waste disposal methods and locations will include coordination with WRRM in the distribution of information and, potentially, a poster contest co-sponsored by the Environmental Services and Waste Resources and Recycling Management Departments.

The results of this and past surveys, along with the suggestions provided by the respondents, will be used to direct the public outreach and education campaign of the Stormwater Quality Program as it continues to develop and evolve. The purpose of outreach campaigns is two-fold: to change public perception and to change behavior. Providing education about the potential risks that stormwater pollution poses to the health of the public and the environment may lead to a greater awareness of these risks. Increasing the public's awareness of stormwater pollution may result in changes in attitude and behavior and will lead to an improvement in the surface water quality of Maricopa County.

Appendix A: 2013 Survey Questions



Stormwater Pollution Awareness Survey 2012-2013

Take the survey on-line: www.maricopa.gov/stormwater or fill-out below

1. Within the past year, do you recall reading, seeing, or hearing messages about stormwater pollution (e.g. "Only Rain in the Drain," "Be the Solution to Water Pollution")? ☐ Yes ☐ No

2. Do you think any of the following potential sources of pollution pose a threat to our environment?

	No Threat	Minimal Threat	Somewhat Threatening	Serious Threat	Very Serious Threat
Automobile Oil/Fluids	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chemical Waste from Industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chemical Waste from Households	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Construction Activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fertilizers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Herbicides/Pesticides	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pet Waste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Runoff from Streets/Parking Lots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sewage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trash/Illegal Dumping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Yard Waste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Do you own a dog? ☐ Yes ☐ No

If YES, do you pick up after your pet and dispose of waste in the trash? ☐ Yes ☐ No

4. Do you engage in any of the following practices? (check all that apply)

- | | |
|--|---|
| <input type="checkbox"/> Compost or use green waste bins to dispose of leaves, grass clippings, or other yard wastes instead of sweeping, blowing, or hosing them into the street. | <input type="checkbox"/> Wash your vehicle at a commercial car wash |
| <input type="checkbox"/> Have your oil changed by a professional or recycle used oil at an oil collection center | <input type="checkbox"/> Dispose of household chemicals properly (by following package directions or taking to a household hazardous waste collection center) |
| | <input type="checkbox"/> Limit the use of pesticides, herbicides, and fertilizers |

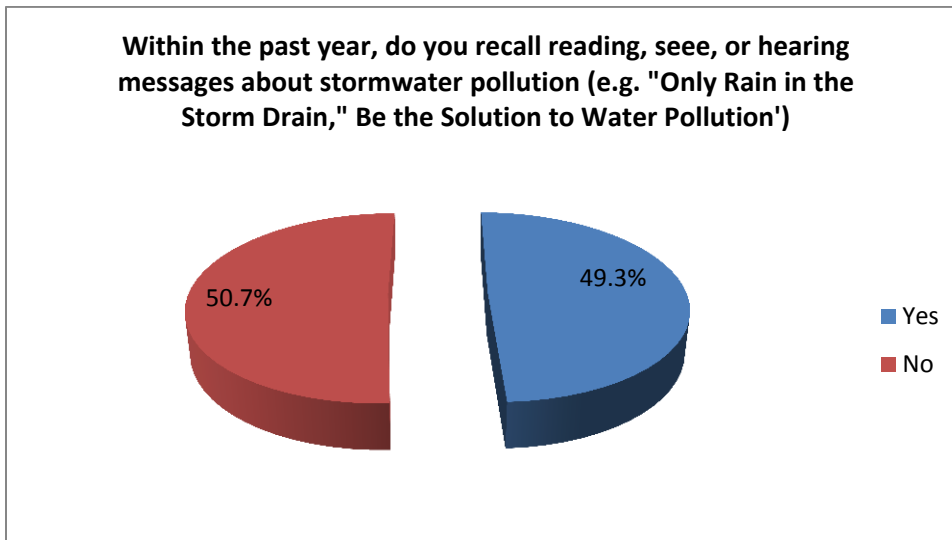
5. In which jurisdiction do you live?

- | | | |
|---|-------------------------------------|---|
| <input type="checkbox"/> Avondale | <input type="checkbox"/> Goodyear | <input type="checkbox"/> Surprise |
| <input type="checkbox"/> Chandler | <input type="checkbox"/> Mesa | <input type="checkbox"/> Tempe |
| <input type="checkbox"/> Fountain Hills | <input type="checkbox"/> Peoria | <input type="checkbox"/> Unincorporated Maricopa County |
| <input type="checkbox"/> Gilbert | <input type="checkbox"/> Phoenix | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Glendale | <input type="checkbox"/> Scottsdale | |

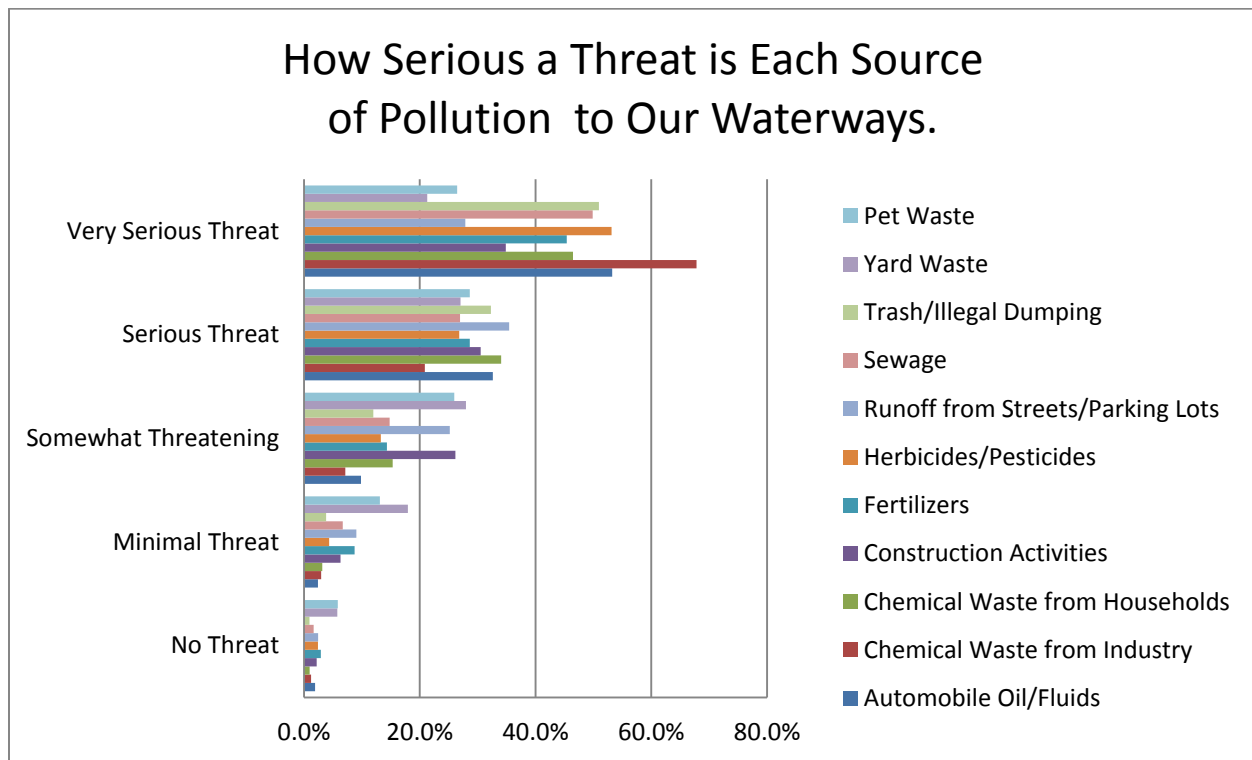
6. Do you have any comments or suggestions for the Stormwater Quality Program?

Appendix B: 2013 Survey Results

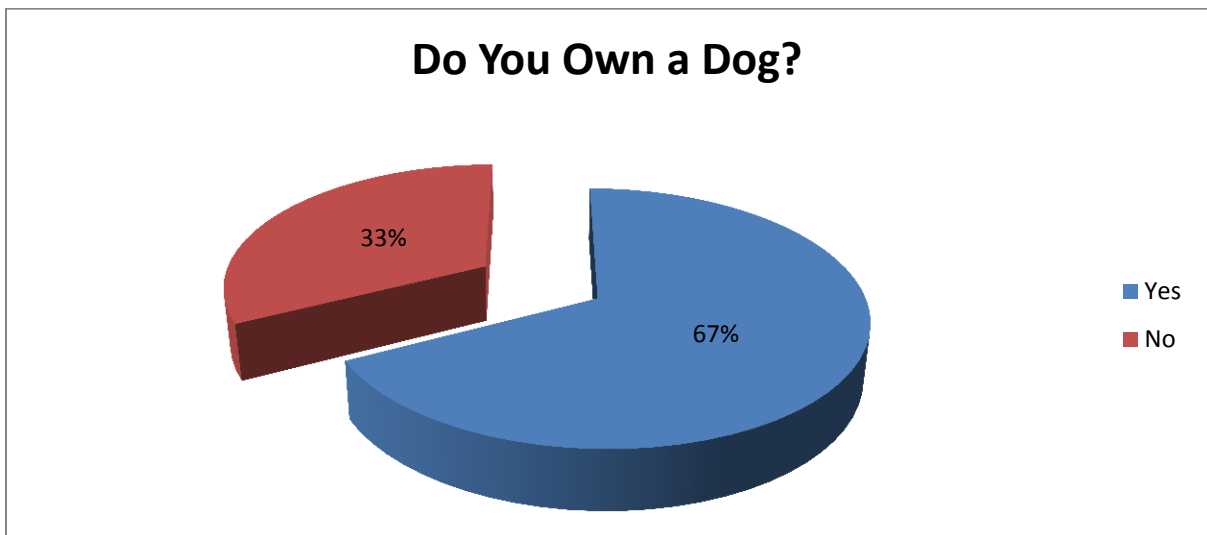
Question 1: Within the past year, do you recall reading, seeing, or hearing messages about stormwater pollution (e.g. "Only Rain in the Storm Drain," "Be the Solution to Stormwater Pollution")?



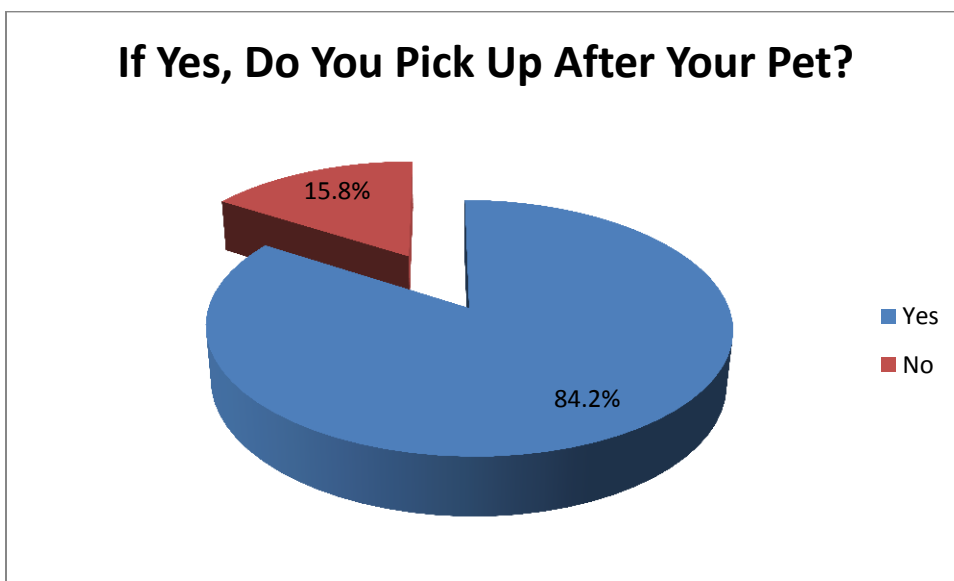
Question 2: Please indicate how serious a threat each source of pollution is to our waterways.

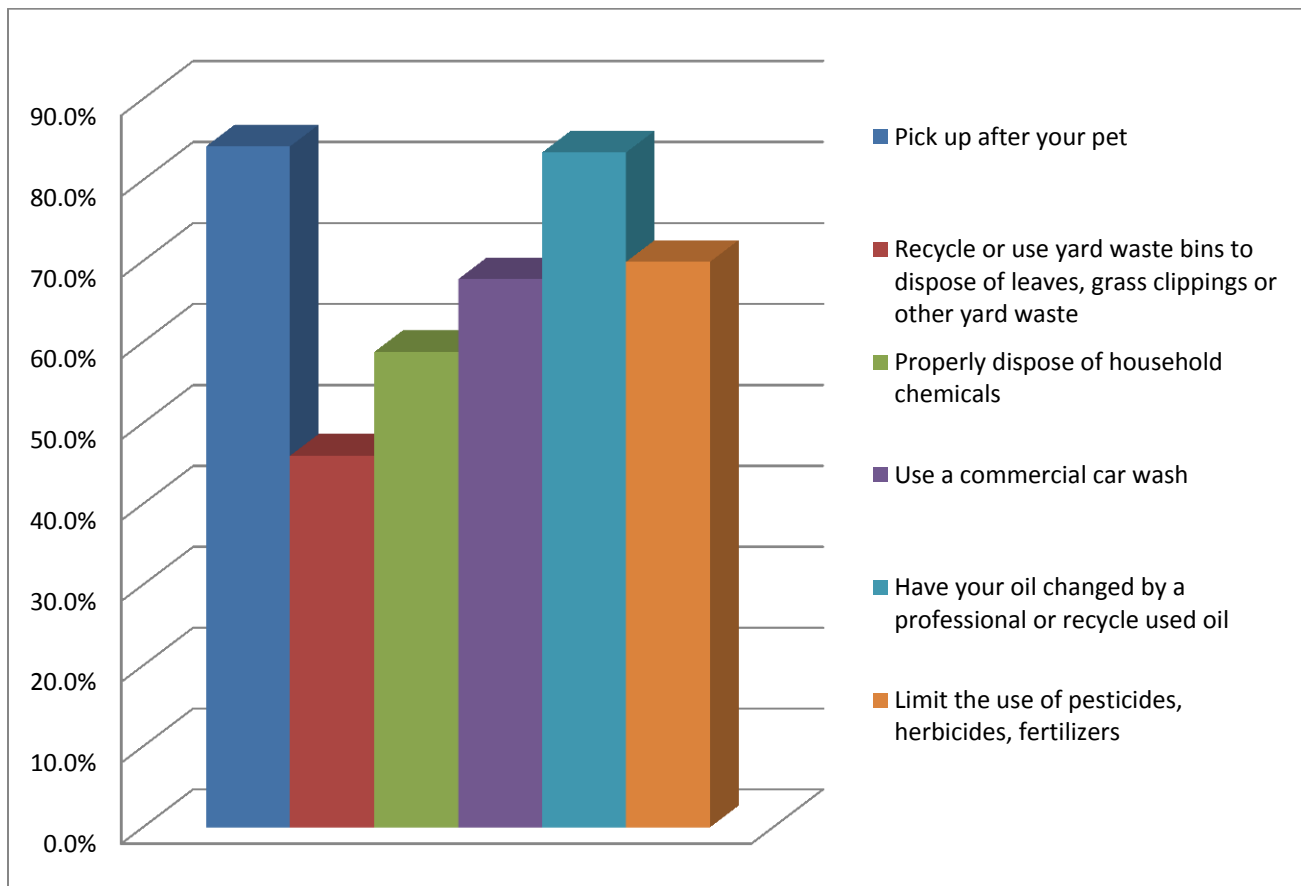


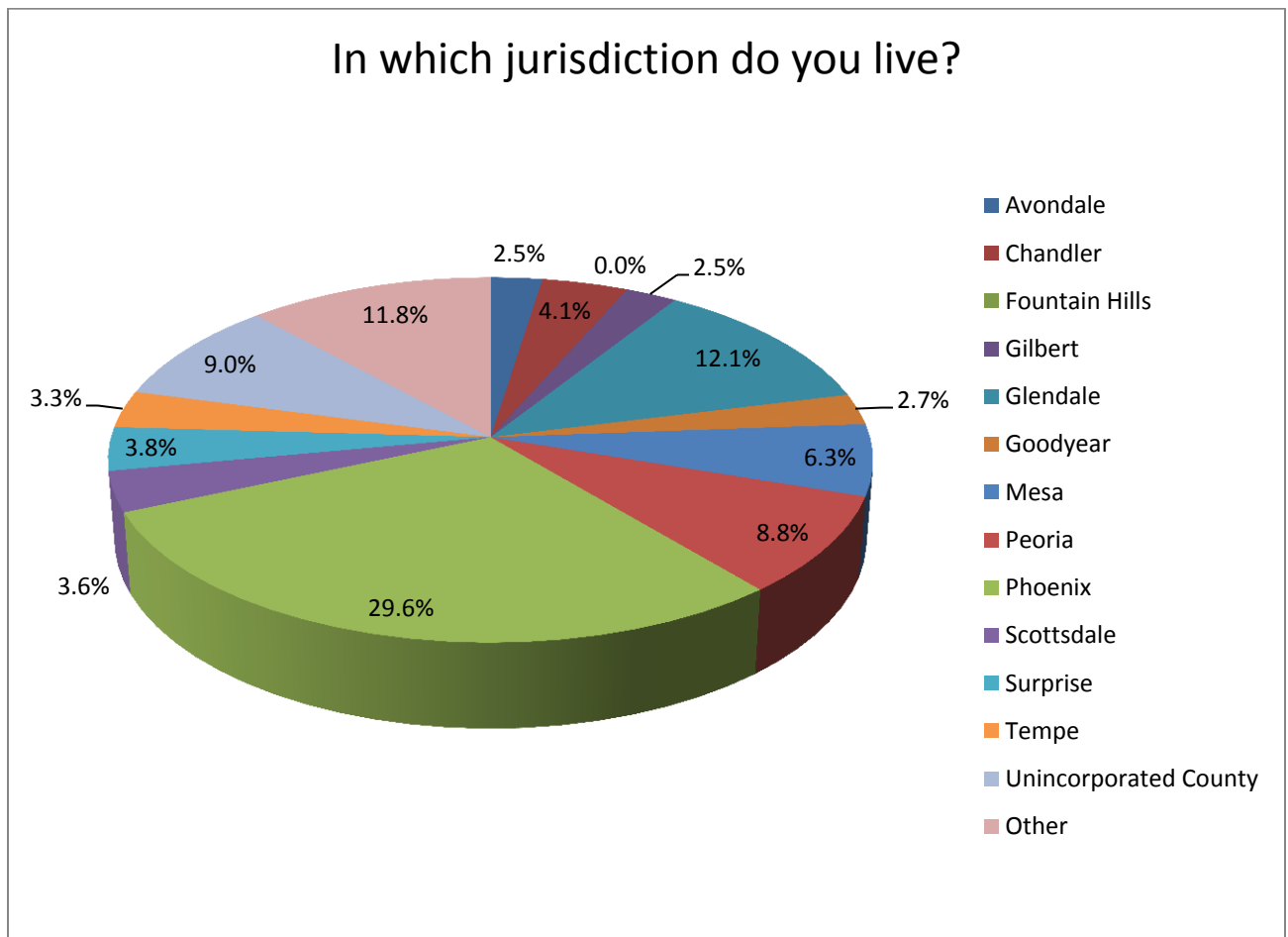
Question 3a: Do you own a dog?



Question 3b: If yes, do you pick up after your pet and dispose of waste in the trash?



Question 4: Do you engage in any of the following practices? (check all that apply)

Question 5: In which jurisdiction do you live?**Question 6: Do you have any comments or suggestions for the Stormwater Quality Program.**

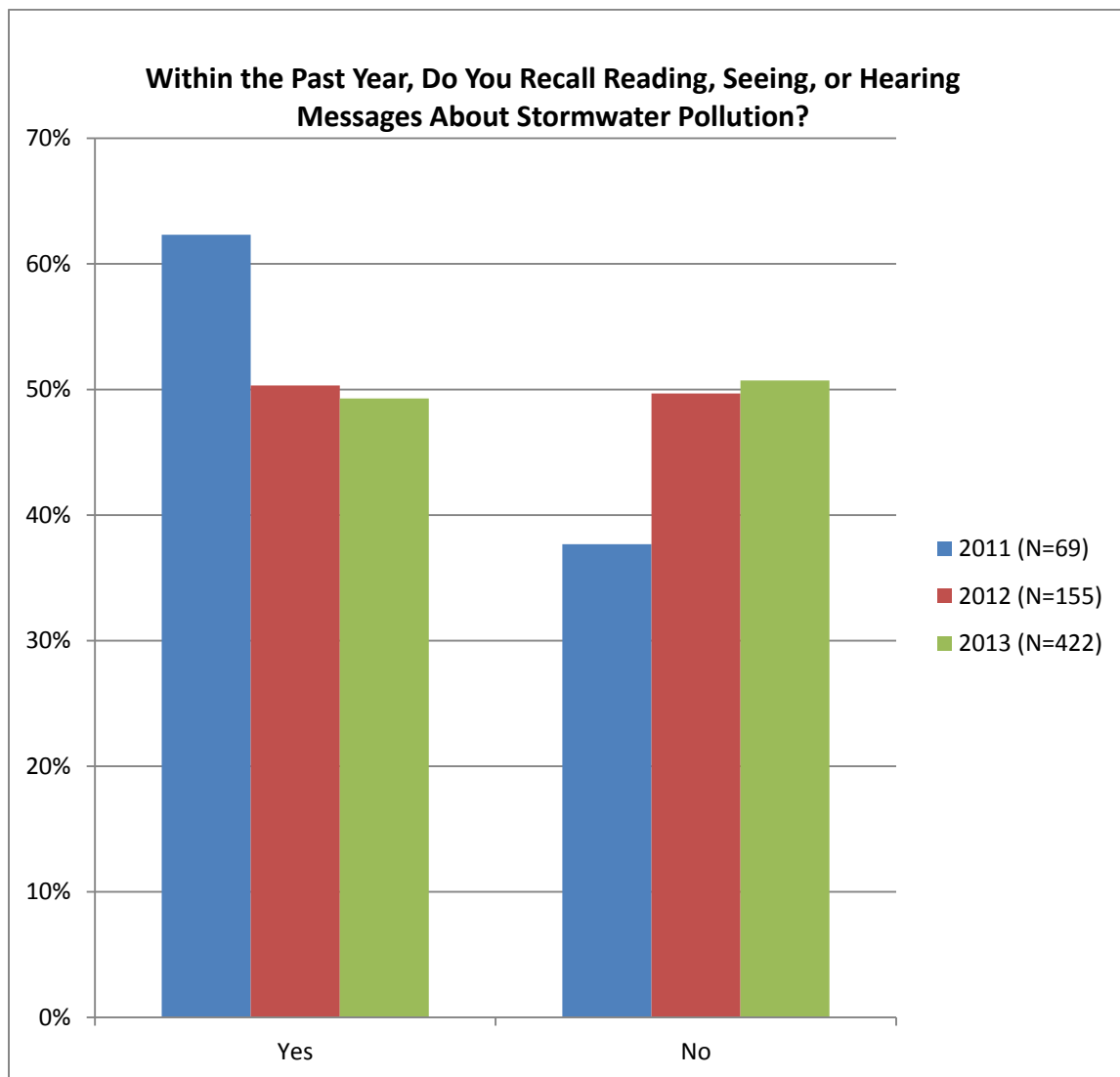
- Keep up the good work
- More education-this is the first info I have heard or seen
- Advertise with flood safety
- Paul was excellent and really got the kids to think. Please continue this outreach program.
- Thank you for the work you are doing
- Good info to know
- Keep up the good work
- I'd like to hear more-STE2139145@maricopa.edu
- We need to stop pollution
- Keep the good job; hope for more community support
- Thanks for bringing it to my attention
- I think this is a good program to get the people more aware and involved in this problem

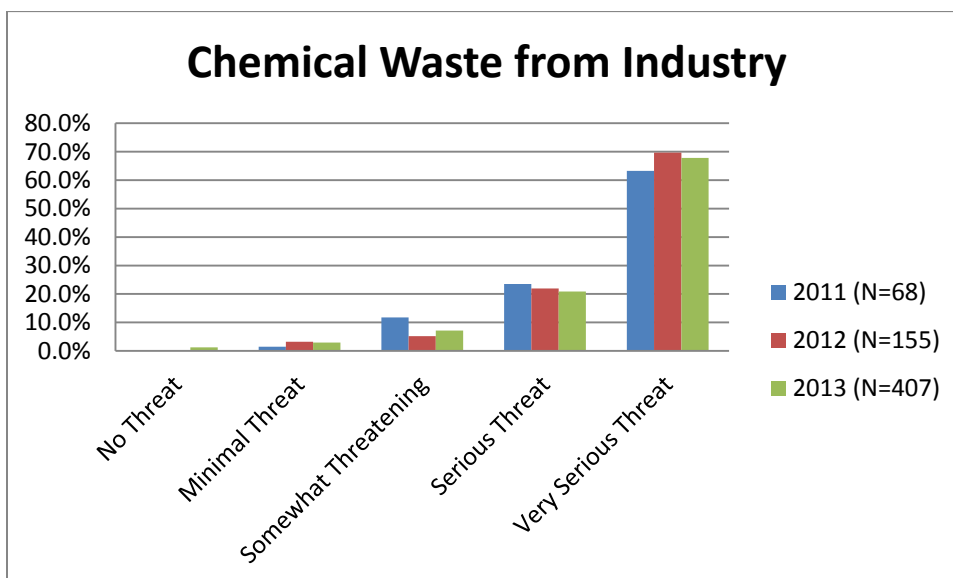
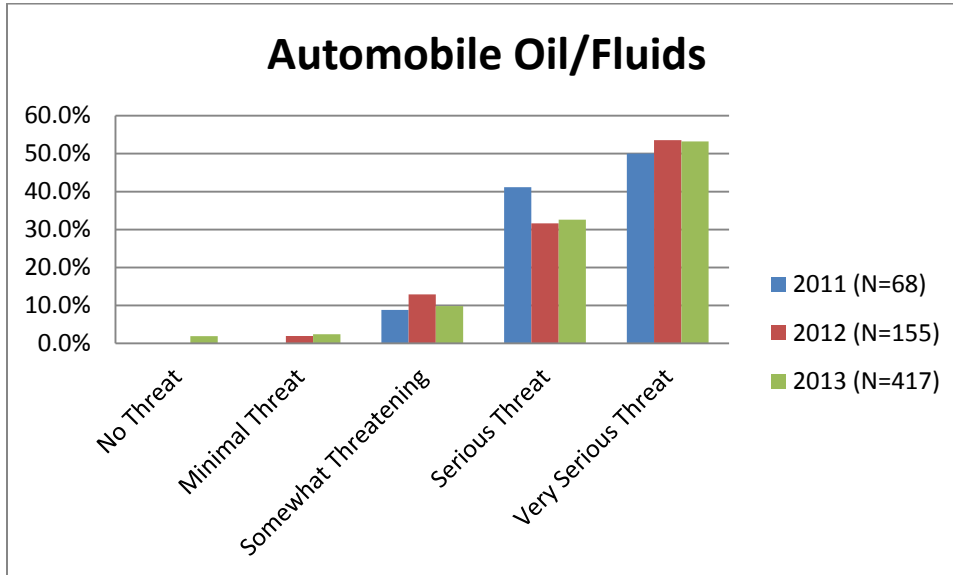
- Not at this time
- Youth education is a key!
- Get more info out to the public
- Have no knowledge
- Is a great thing to know that your concern to let people have more information
- Great program
- More advertising
- Need more information
- Kudos to Maricopa County for all the educational programs helping understanding of desert-both dry and wet!!
- Need to make your dept. profile high.
- More outreach!
- Get more info out
- More incentives and more inspections?
- Teach our children in school programs
- What a great idea! Paul does a nice presentation
- You guys need more advertisement
- Great job with public awareness
- Not at this time
- Great job
- Storm drain stencils painted by volunteers
- Plant cactus only
- Great awareness
- Keep up adds--working
- Nope
- No
- Put it on the O'Reilly Show (Fox)
- None
- No
- Not now
- Move 5 million people out of state
- No
- Watch the people that drain pools into street
- Thanks
- Not now
- This brings a lot of interest to me and plan on being safe with chemicals
- More public education re: yard waste and pet waste
- Keep educating. Ban blowers used for landscaping
- I would like more of this info to be presented to others
- First time I come into contact with Environmental Services Department. Very helpful
- Inform Phoenix and more awareness in the valley
- I appreciate the flexibility of the information given to our students dependig on how much they know and their curiosity to learn more!
- Not at this time

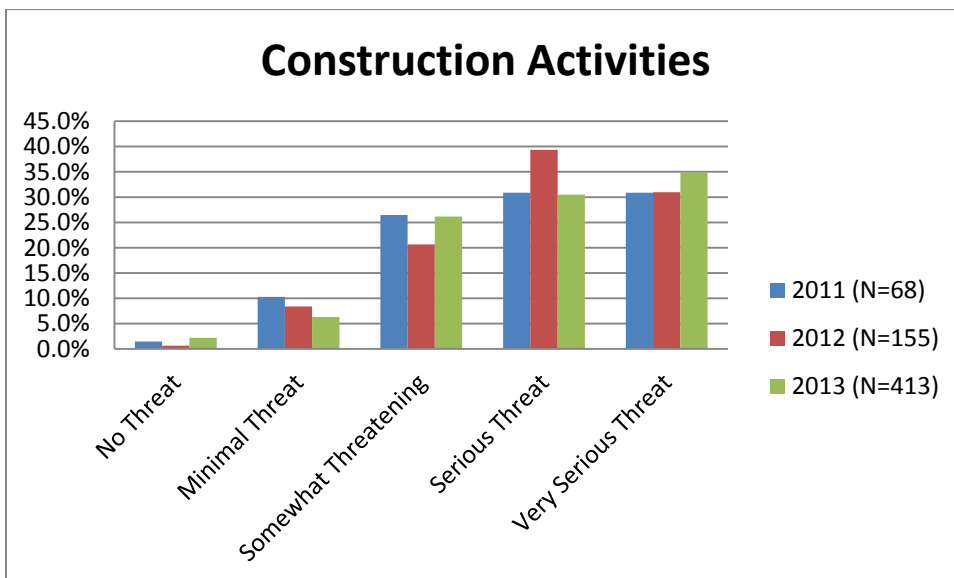
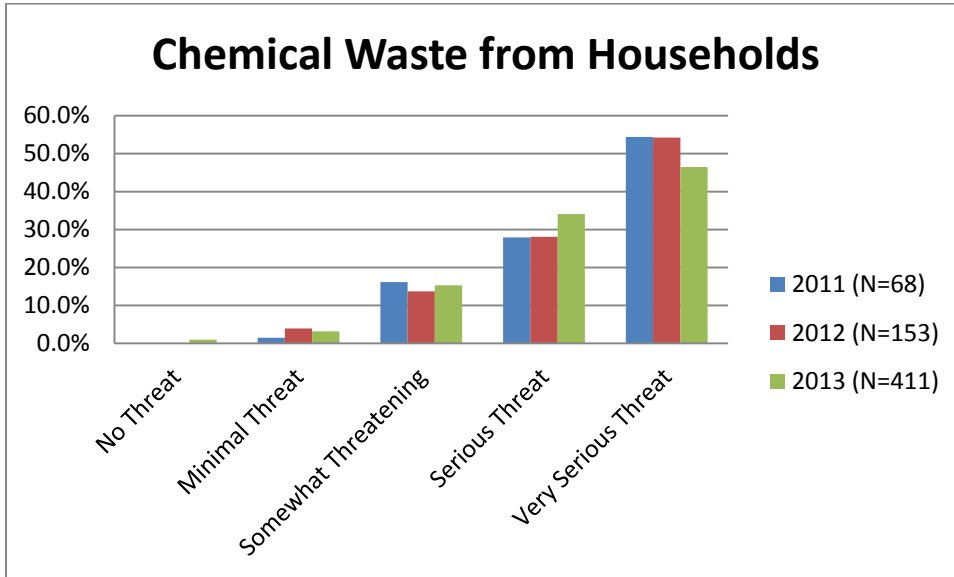
- No. They are too awesome
- This program could restore Earth to its natural beauty
- Have a presence in the elementary schools
- No
- Glad to see education booth at special event
- Be as strict as you can. Thank you
- Teach all kids from kindergarten to 12th grades and for kids to discipline and teach parents.
- No
- Good job on the awareness. Thx!
- NO!
- No you guys are doing great
- Bigger fines for violations
- None
- Make it easier to understand for homeowners; work with the City of Surprise in the outlying areas-so we can get the word out there. Have a catchy jingle-that school kids can learn and pass on to their parents.
- Do you provide education at public libraries?
- None at this time
- Household chemical waste collection points and frequency need to be increased
- None at this time
- Paul does a great job with his outreach program. Friendly and very informative. He was at the Lake Pleasant public lands day cleanup
- The survey is too long
- People don't see a reason to change habits until it is forcefully made clear to them. Consider incentives for doing the right thing and penalties for flagrantly disregarding the health of the environment
- I had two gentlemen come and talk to my third graders and learned a lot about stormwater pollution myself. I thought the presentation was wonderful and perfect for 3rd grade. The kids understood it all! Thank you!
- No, just recently heard your speaker at our dog club meeting
- Good information
- I participated in Lake Pleasant's Dam Good walk/Run/Hike and this subject's information was included in the goodie bag. It was an interesting read and I felt that I have learned from it.
- Keep up the good job!!!

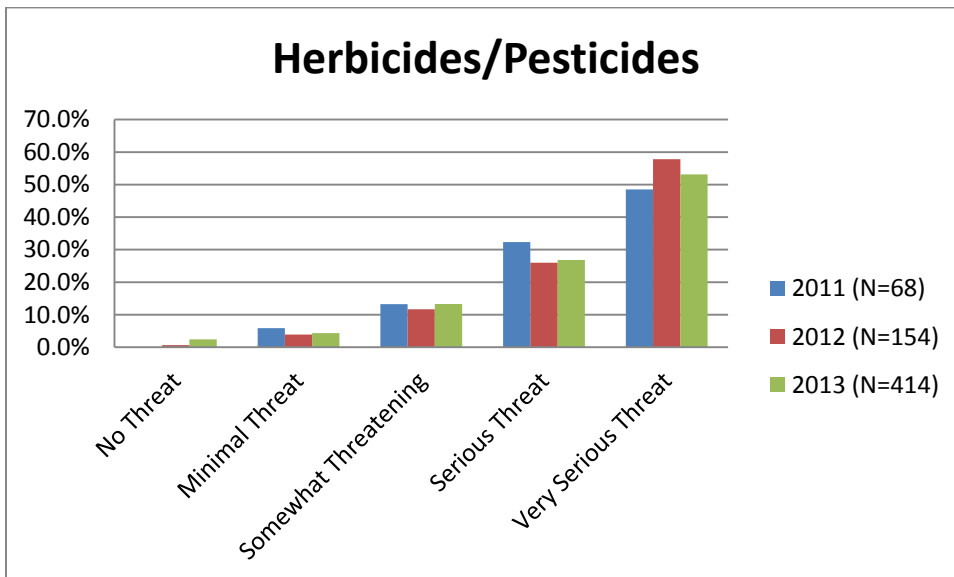
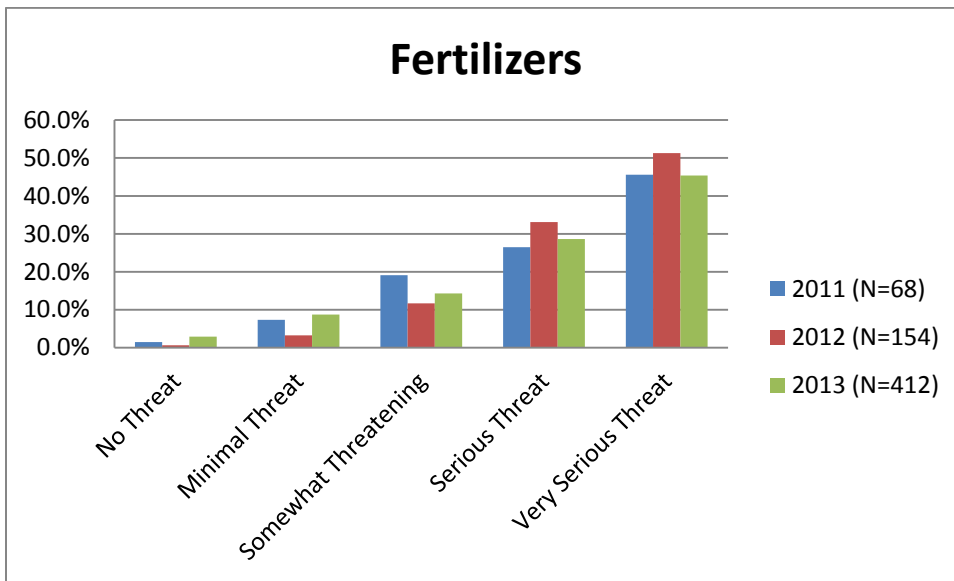
Appendix C: Comparison with FY 2011 and FY 2012 Surveys

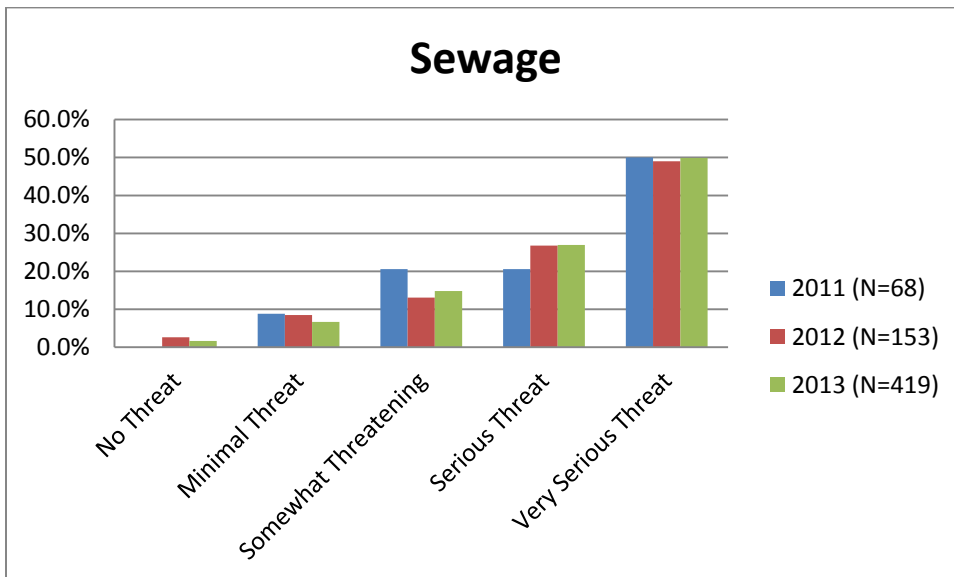
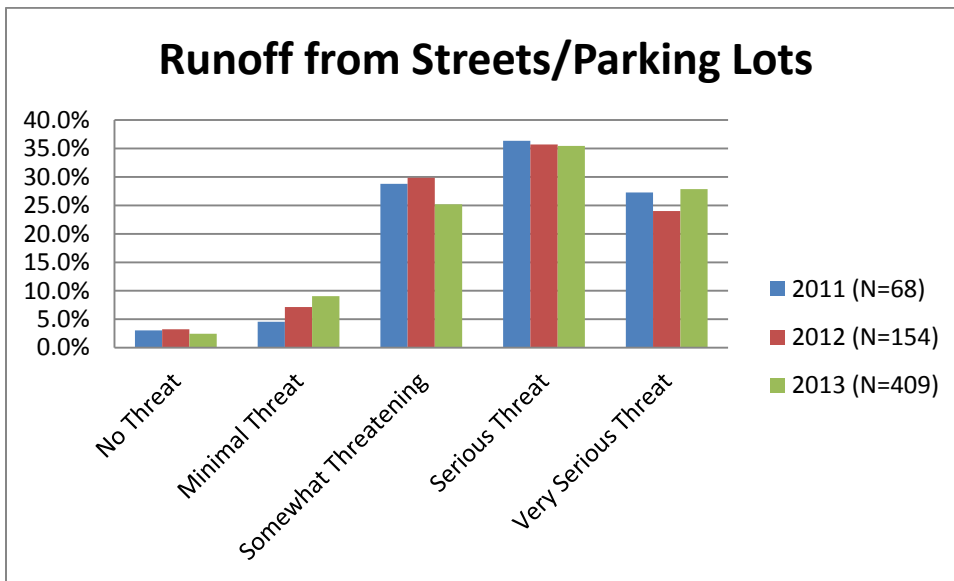
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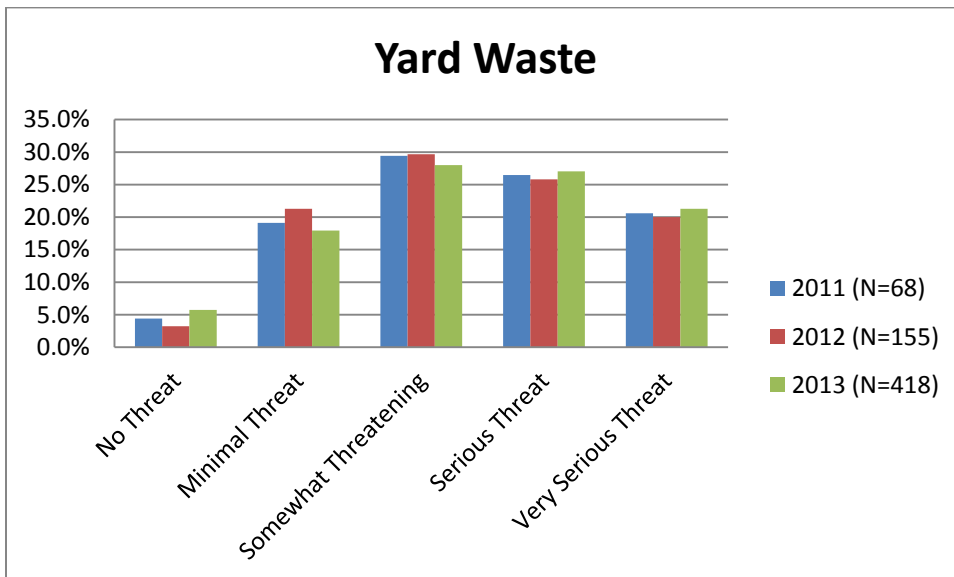
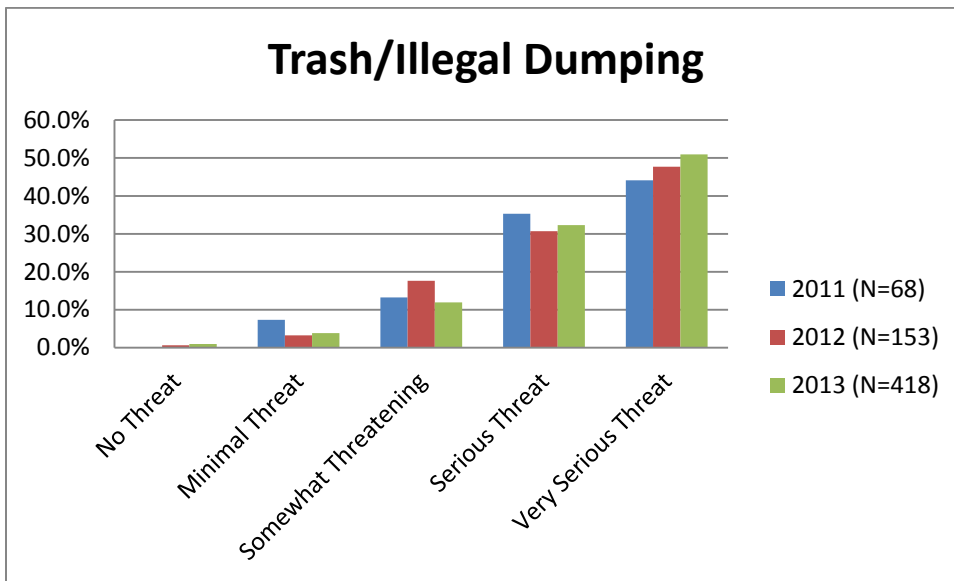


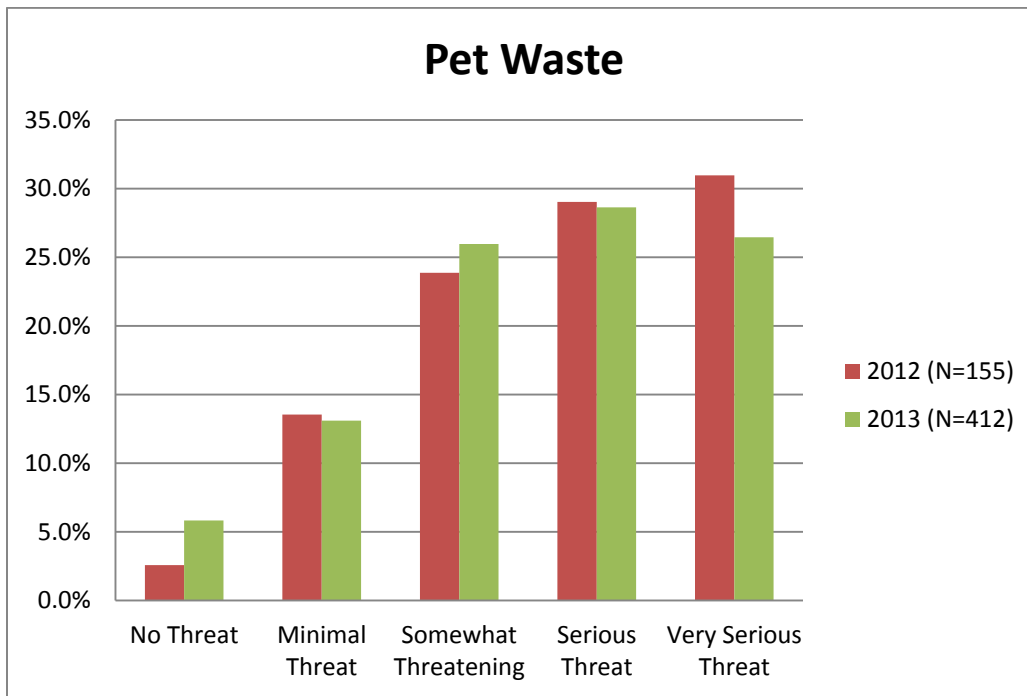
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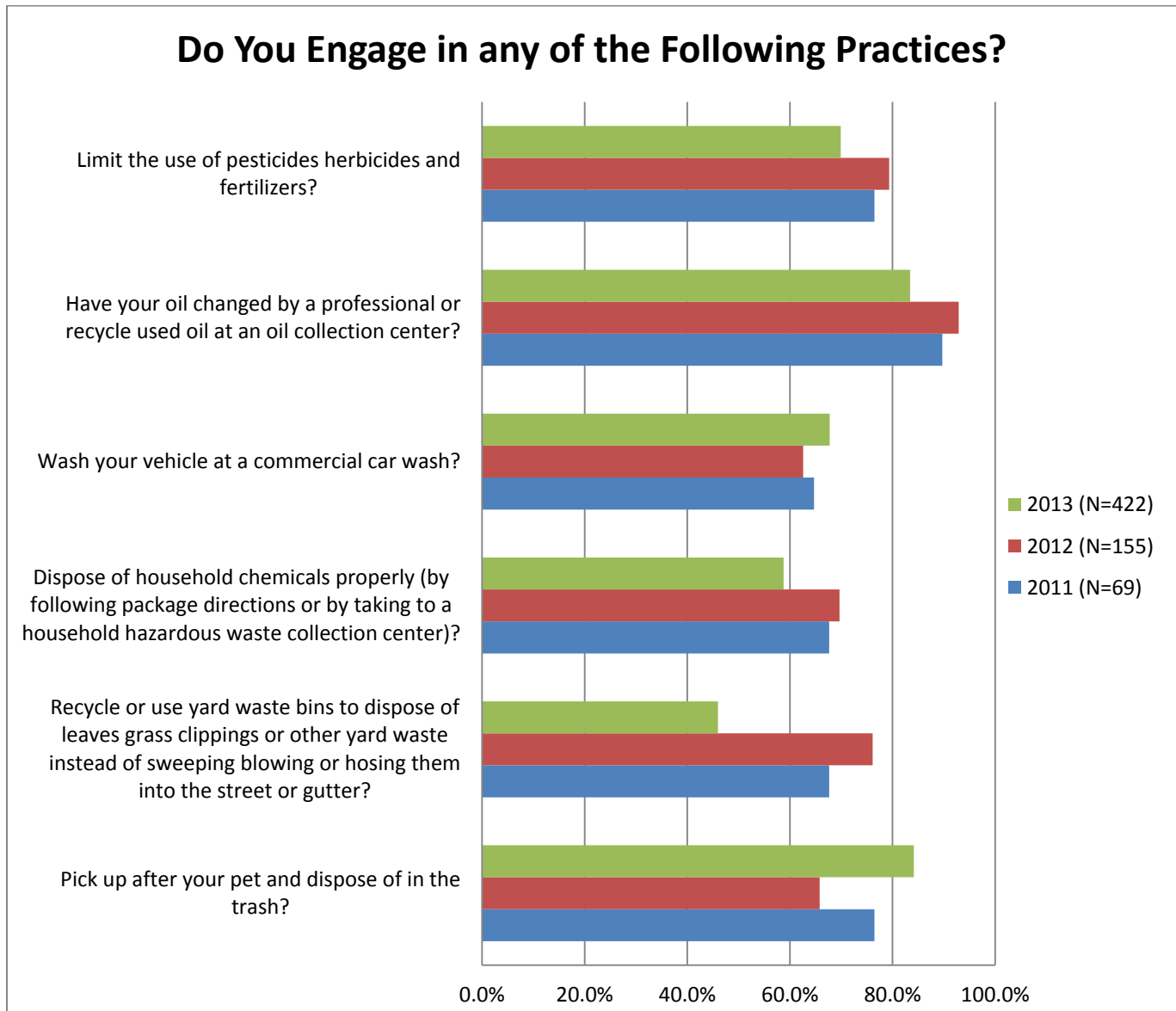


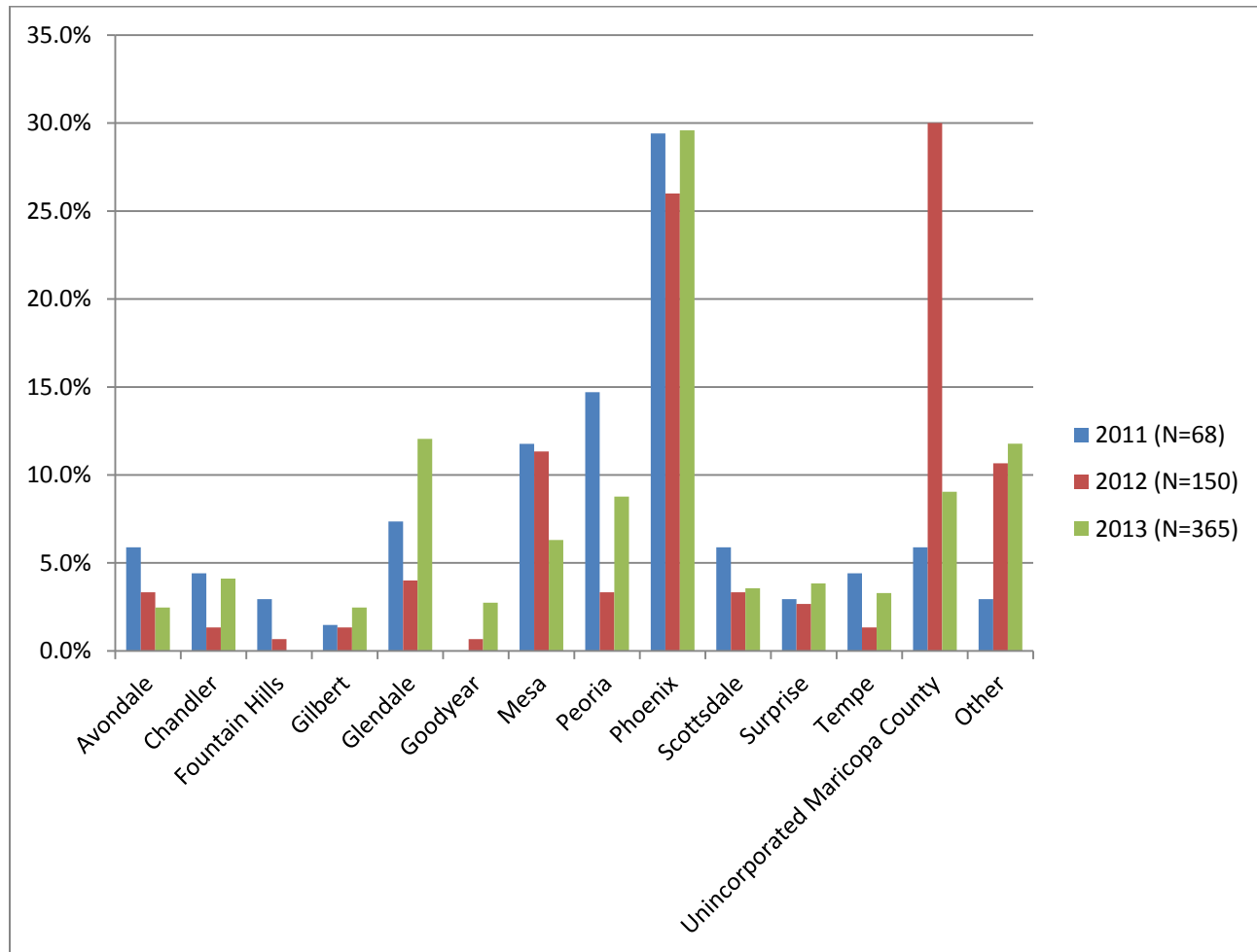






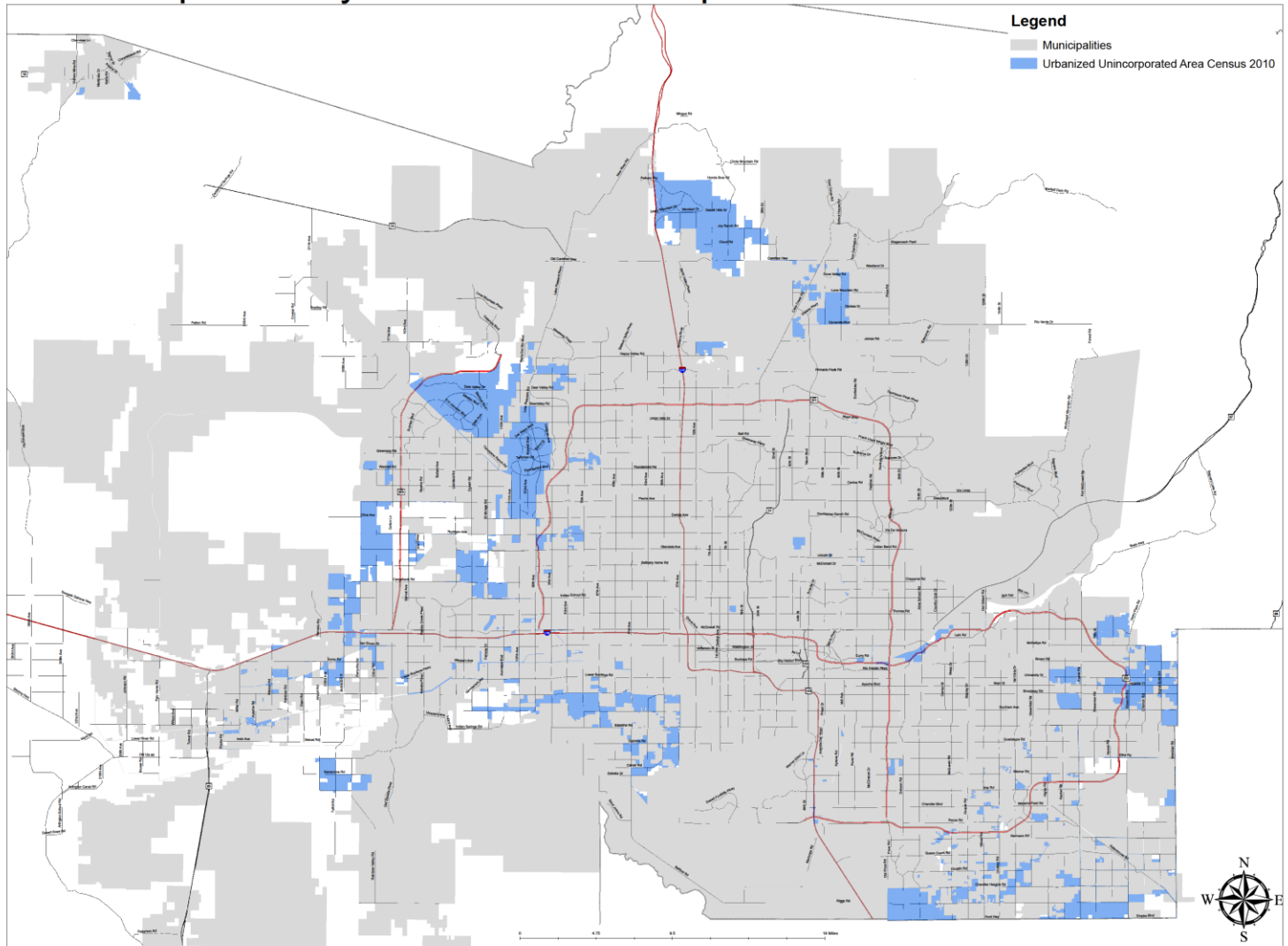


Question 3: Do you engage in any of the following practices? (check all that apply)

Question 4: In which jurisdiction do you live?

Appendix D: Map of Urbanized Unincorporated Maricopa County

Maricopa County Urbanized Unincorporated Area - Census 2010



Appendix E: Survey Response Distribution

